

manufacturing production line using a virtual kanban system  
and a manufacturing execution system comprising:

said manufacturing execution system for automatically  
controlling routing of product lots and production inputs in  
said manufacturing production line based on a production  
scheduling model, wherein feedback data from said production  
line is provided to said manufacturing execution system;

a database for storing said model and said feedback data,  
wherein said feedback data is used to provide values for  
variables of said model; and

a simulating system for simulating operation of said  
production line according to said model, said simulating  
system using said feedback data from said database in  
performing said simulation, said simulating system further  
comprising a user interface through which changes to said  
model can be made;

wherein said manufacturing execution system monitors  
consumption of said production inputs and orders additional  
production inputs using electronic kanbans which are cycled in  
response to said feedback data;

wherein said feedback data is divided into two sets of  
data received by said manufacturing execution system in  
separate transmissions of said feedback data;

wherein a first of said two sets of data comprises data specifying a type of equipment in said production line;

wherein a second of said two sets of data comprises data specifying an operating status of said equipment, status of said product lots and status of said production inputs; and

wherein said manufacturing execution system rechecks a routing schedule for said production inputs and said product lots each time a transmission of said second set of feedback data is received.

8. (once amended; rewritten as an independent claim)

[The system of claim 7,] A system for controlling a manufacturing production line using a virtual kanban system and a manufacturing execution system comprising:

said manufacturing execution system for automatically controlling routing of product lots and production inputs in said manufacturing production line based on a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution system;

a database for storing said model and said feedback data, wherein said feedback data is used to provide values for variables of said model; and

a simulating system for simulating operation of said production line according to said model, said simulating system using said feedback data from said database in performing said simulation, said simulating system further comprising a user interface through which changes to said model can be made;

wherein said manufacturing execution system monitors consumption of said production inputs and orders additional production inputs using electronic kanbans which are cycled in response to said feedback data;

wherein said manufacturing execution system also determines a capacity of said equipment in said production line based on said feedback data and generates routes for said product lots in accordance therewith; and

wherein said manufacturing execution system scans generated routes for equipment in said production line without a determined capacity to determine potential problem areas in said generated routes.

11. (once amended; rewritten as an independent claim)

[The system of claim 10,] A system for controlling a manufacturing production line using a virtual kanban system and a manufacturing execution system comprising:

said manufacturing execution system for automatically controlling routing of product lots and production inputs in said manufacturing production line based on a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution system;

a database for storing said model and said feedback data, wherein said feedback data is used to provide values for variables of said model; and

a simulating system for simulating operation of said production line according to said model, said simulating system using said feedback data from said database in performing said simulation, said simulating system further comprising a user interface through which changes to said model can be made;

wherein said manufacturing execution system monitors consumption of said production inputs and orders additional production inputs using electronic kanbans which are cycled in response to said feedback data;

wherein said manufacturing execution system generates a kanban parameter for each piece of said equipment in said production line which uses a production input; and

wherein said manufacturing execution system generates proposed kanban stages within said production line defined in accordance with said kanban parameters.

17. (once amended; rewritten as an independent claim)

[The system of claim 16,] A system for controlling a manufacturing production line using a virtual kanban system and a manufacturing execution control means comprising:

said manufacturing execution control means for automatically controlling routing of product lots and production inputs in said manufacturing production line based on a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution control means;

database means for storing said model and said feedback data, wherein said feedback data is used to provide values for variables of said model; and

simulating means for simulating operation of said production line according to said model, said simulating means using said feedback data from said database means in performing said simulation, said simulating means further comprising a user interface means through which changes to said model can be made;

wherein said manufacturing execution control means monitor consumption of said production inputs and order additional production inputs using electronic kanbans which are cycled in response to said feedback data; and

wherein said manufacturing execution control means rechecks a routing schedule for said production inputs and said product lots each time a transmission [of said second set] of feedback data is received specifying an operating status of said equipment, status of said product lots and status of said production inputs.

19. (once amended; rewritten as an independent claim)

[The system of claim 18,] A system for controlling a manufacturing production line using a virtual kanban system and a manufacturing execution control means comprising:

said manufacturing execution control means for automatically controlling routing of product lots and production inputs in said manufacturing production line based on a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution control means;

database means for storing said model and said feedback data, wherein said feedback data is used to provide values for variables of said model; and

simulating means for simulating operation of said production line according to said model, said simulating means using said feedback data from said database means in performing said simulation, said simulating means further comprising a user interface means through which changes to said model can be made;

wherein said manufacturing execution control means monitor consumption of said production inputs and order additional production inputs using electronic kanbans which are cycled in response to said feedback data;

wherein said manufacturing execution control means determines a capacity of said equipment in said production line based on said feedback data and generates routes for said product lots in accordance therewith; and

wherein said manufacturing execution control means scans generated routes for equipment in said production line without a determined capacity to determine potential problem areas in said generated routes.

22. (once amended; rewritten as an independent claim)

[The system of claim 21,] A system for controlling a manufacturing production line using a virtual kanban system and a manufacturing execution control means comprising:

said manufacturing execution control means for automatically controlling routing of product lots and production inputs in said manufacturing production line based on a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution control means;

database means for storing said model and said feedback data, wherein said feedback data is used to provide values for variables of said model; and

simulating means for simulating operation of said production line according to said model, said simulating means using said feedback data from said database means in performing said simulation, said simulating means further comprising a user interface means through which changes to said model can be made;

wherein said manufacturing execution control means monitor consumption of said production inputs and order additional production inputs using electronic kanbans which are cycled in response to said feedback data; and



wherein said manufacturing execution control means generates a kanban parameter for each piece of said equipment in said production line which uses a production input; and

wherein said manufacturing execution control means generate proposed kanban stages within said production line defined in accordance with said kanban parameters.

29. (once amended; rewritten as an independent claim)

[The method of claim 28,] A method for controlling a manufacturing production line using a virtual kanban system, the method comprising:

automatically controlling routing of product lots and production inputs in said manufacturing production line with a manufacturing execution system using a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution system;

storing said model and said feedback data in a database, wherein said feedback data is used to provide values for variables of said model;

simulating operation of said production line according to said model with a simulating system, said simulating system using said feedback data from said database in performing said simulation;

monitoring consumption of said production inputs with said manufacturing execution system and ordering additional production inputs using electronic kanbans which are cycled in response to said feedback data; and

[further comprising] rechecking a routing schedule for said production inputs and said product lots each time a transmission of said [second set of] feedback data is received specifying an operating status of said equipment, status of said product lots and status of said production inputs.

31. (once amended; rewritten as an independent claim)

[The method of claim 30, further comprising] A method for controlling a manufacturing production line using a virtual kanban system, the method comprising:

automatically controlling routing of product lots and production inputs in said manufacturing production line with a manufacturing execution system using a production scheduling model, wherein feedback data from said production line is provided to said manufacturing execution system;

storing said model and said feedback data in a database, wherein said feedback data is used to provide values for variables of said model;

simulating operation of said production line according to said model with a simulating system, said simulating system using said feedback data from said database in performing said simulation;

monitoring consumption of said production inputs with said manufacturing execution system and ordering additional production inputs using electronic kanbans which are cycled in response to said feedback data;

determining a capacity of said equipment in said production line based on said feedback data and generating routes for said product lots in accordance therewith; and

scanning generated routes for equipment in said production line without a determined capacity to determine potential problem areas in said generated routes.

34. (once amended; rewritten as an independent claim)

[The method of claim 33, further comprising] A method for controlling a manufacturing production line using a virtual kanban system, the method comprising:

automatically controlling routing of product lots and production inputs in said manufacturing production line with a manufacturing execution system using a production scheduling

model, wherein feedback data from said production line is provided to said manufacturing execution system;

storing said model and said feedback data in a database, wherein said feedback data is used to provide values for variables of said model;

simulating operation of said production line according to said model with a simulating system, said simulating system using said feedback data from said database in performing said simulation;

monitoring consumption of said production inputs with said manufacturing execution system and ordering additional production inputs using electronic kanbans which are cycled in response to said feedback data;

generating a kanban parameter with said manufacturing execution system for each piece of equipment in said production line which uses a production input; and

generating proposed kanban stages within said production line in accordance with said kanban parameters.